



SEQUENCE LISTING

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<120> Ion channels

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<140> US 09/701,747

<141> 2000-12-04

<150> PCT/GB99/01743

<151> 1999-06-03

<150> GB 9811965.4

<151> 1998-06-03

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<170> PatentIn Ver. 2.1

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<211> 2622

<212> DNA

<213> Rattus norvegicus

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<213> Rattus norvegicus

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Ala Gln Gly Pro Ala Ala Pro Arg Asp Leu Ala Thr Phe Ala Ser Thr
35 40 45
Ser Thr Leu His Gly Leu Gly Arg Ala Cys Gly Pro Gly Pro His Gly
50 55 60
Leu Arg Arg Thr Leu Trp Val Leu Ala Leu Leu Thr Ser Leu Ala Ala
65 70 75 80
Phe Leu Tyr Gln Ala Ala Ser Leu Ala Arg Gly Tyr Leu Thr Arg Pro
85 90 95
His Leu Val Ala Met Asp Pro Ala Ala Pro Ala Pro Val Ala Gly Phe
100 105 110

cb
cont

Pro Ala Val Thr Leu Cys Asn Ile Asn Arg Phe Arg His Ser Ala Leu
115 120 125

Ser Asp Ala Asp Ile Phe His Leu Ala Asn Leu Thr Gly Leu Pro Pro
130 135 140

Lys Asp Arg Asp Gly His Arg Ala Ala Gly Leu Arg Tyr Pro Glu Pro
145 150 155 160

Asp Met Val Asp Ile Leu Asn Arg Thr Gly His Gln Leu Ala Asp Met
165 170 175

Leu Lys Ser Cys Asn Phe Ser Gly His His Cys Ser Ala Ser Asn Phe
180 185 190

Ser Val Val Tyr Thr Arg Tyr Gly Lys Cys Tyr Thr Phe Asn Ala Asp
195 200 205

Pro Gln Ser Ser Leu Pro Ser Arg Ala Gly Gly Met Gly Ser Gly Leu
210 215 220

Glu Ile Met Leu Asp Ile Gln Gln Glu Glu Tyr Leu Pro Ile Trp Arg
225 230 235 240

Glu Thr Asn Glu Thr Ser Phe Glu Ala Gly Ile Arg Val Gln Ile His
245 250 255

Ser Gln Glu Glu Pro Pro Tyr Ile His Gln Leu Gly Phe Gly Val Ser
260 265 270

Pro Gly Phe Gln Thr Phe Val Ser Cys Gln Glu Gln Arg Leu Thr Tyr
275 280 285

Leu Pro Gln Pro Trp Gly Asn Cys Arg Ala Glu Ser Lys Leu Arg Glu
290 295 300

Pro Glu Leu Gln Gly Tyr Ser Ala Tyr Ser Val Ser Ala Cys Arg Leu
305 310 315 320

Arg Cys Glu Lys Glu Ala Val Leu Gln Arg Cys His Cys Arg Met Val
325 330 335

His Met Pro Gly Asn Glu Thr Ile Cys Pro Pro Asn Ile Tyr Ile Glu
340 345 350

Cys Ala Asp His Thr Leu Asp Ser Leu Gly Gly Gly Ser Glu Gly Pro
355 360 365

Cys Phe Cys Pro Thr Pro Cys Asn Leu Thr Arg Tyr Gly Lys Glu Ile
370 375 380

Ser Met Val Lys Ile Pro Asn Arg Gly Ser Ala Arg Tyr Leu Ala Arg
385 390 395 400

Lys Tyr Asn Arg Asn Glu Thr Tyr Ile Arg Glu Asn Phe Leu Val Leu
405 410 415

C6
cont

Asp Val Phe Phe Glu Ala Leu Thr Ser Glu Ala Met Glu Gln Arg Ala
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 Ala Tyr Gly Leu Ser Ala Leu Leu Gly Asp Leu Gly Gly Gln Met Gly
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 450 455 460
 Ile Tyr Glu Val Ser Trp Asp Arg Leu Lys Arg Val Trp Arg Arg Pro
 465 470 475 480
 Lys Thr Pro Leu Arg Thr Ser Thr Gly Gly Ile Ser Thr Leu Gly Leu
 485 490 495
 Gln Glu Leu Lys Glu Gln Ser Pro Cys Pro Asn Arg Gly Arg Ala Glu
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 Gly Gly Gly Ala Ser Asn Leu Leu Pro Asn His His His Pro His Gly
 515 520 525
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<210> 3
 <211> 526
 <212> PRT
 <213> Rattus norvegicus

<400> 3
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 Ile Phe Ser Tyr Glu Arg Leu Ser Leu Lys Arg Ala Leu Trp Ala Leu
 35 40 45
 Cys Phe Leu Gly Ser Leu Ala Val Leu Leu Cys Val Cys Thr Glu Arg
 50 55 60
 Val Gln Tyr Tyr Phe Cys Tyr His His Val Thr Lys Leu Asp Glu Val
 65 70 75 80
 Ala Ala Ser Gln Leu Thr Phe Pro Ala Val Thr Leu Cys Asn Leu Asn
 85 90 95
 Glu Phe Arg Phe Ser Gln Val Ser Lys Asn Asp Leu Tyr His Ala Gly
 100 105 110
 Glu Leu Leu Ala Leu Leu Asn Asn Arg Tyr Glu Ile Pro Asp Thr Gln
 115 120 125
 Met Ala Asp Glu Lys Gln Leu Glu Ile Leu Gln Asp Lys Ala Asn Phe

C6
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135

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Arg Ser Phe Lys Pro Lys Pro Phe Asn Met Arg Glu Phe Tyr Asp Arg
145 150 155 160

Ala Gly His Asp Ile Arg Asp Met Leu Leu Ser Cys His Phe Arg Gly
165 170 175

Glu Ala Cys Ser Ala Glu Asp Phe Lys Val Val Phe Thr Arg Tyr Gly
180 185 190

Lys Cys Tyr Thr Phe Asn Ser Gly Gln Asp Gly Arg Pro Arg Leu Lys
195 200 205

Thr Met Lys Gly Gly Thr Gly Asn Gly Leu Glu Ile Met Leu Asp Ile
210 215 220

Gln Gln Asp Glu Tyr Leu Pro Val Trp Gly Glu Thr Asp Glu Thr Ser
225 230 235 240

Phe Glu Ala Gly Ile Lys Val Gln Ile His Ser Gln Asp Glu Pro Pro
245 250 255

Phe Ile Asp Gln Leu Gly Phe Gly Val Ala Pro Gly Phe Gln Thr Phe
260 265 270

Val Ser Cys Gln Glu Gln Arg Leu Ile Tyr Leu Pro Ser Pro Trp Gly
275 280 285

Thr Cys Asn Ala Val Thr Met Asp Ser Asp Phe Phe Asp Ser Tyr Ser
290 295 300

Ile Thr Ala Cys Arg Ile Asp Cys Glu Thr Arg Tyr Leu Val Glu Asn
305 310 315 320

Cys Asn Cys Arg Met Val His Met Pro Gly Asp Ala Pro Tyr Cys Thr
325 330 335

Pro Glu Gln Tyr Lys Glu Cys Ala Asp Pro Ala Leu Asp Phe Leu Val
340 345 350

Glu Lys Asp Gln Glu Tyr Cys Val Cys Glu Met Pro Cys Asn Leu Thr
355 360 365

Arg Tyr Gly Lys Glu Leu Ser Met Val Lys Ile Pro Ser Lys Ala Ser
370 375 380

Ala Lys Tyr Leu Ala Lys Lys Phe Asn Lys Ser Glu Gln Tyr Ile Gly
385 390 395 400

Glu Asn Ile Leu Val Leu Asp Ile Phe Phe Glu Val Leu Asn Tyr Glu
405 410 415

Thr Ile Glu Gln Lys Lys Ala Tyr Glu Ile Ala Gly Leu Leu Gly Asp
420 425 430

Ile Gly Gly Gln Met Gly Leu Phe Ile Gly Ala Ser Ile Leu Thr Val

cb
cont

435

440

445

Leu Glu Leu Phe Asp Tyr Ala Tyr Glu Val Ile Lys His Arg Leu Cys
 450 455 460

Arg Arg Gly Lys Cys Gln Lys Glu Ala Lys Arg Ser Ser Ala Asp Lys
 465 470 475 480

Gly Val Ala Leu Ser Leu Asp Asp Val Lys Arg His Asn Pro Cys Glu
 485 490 495

Ser Leu Arg Gly His Pro Ala Gly Met Thr Tyr Ala Ala Asn Ile Leu
 500 505 510

Pro His His Pro Ala Arg Gly Thr Phe Glu Asp Phe Thr Cys
 515 520 525

<210> 4

<211> 26

<212> DNA

<213> Rattus norvegicus

<400> 4

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<212> DNA

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25

<210> 6

<211> 25

<212> DNA

<213> Rattus norvegicus

<400> 6

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25

<210> 7

<211> 25

<212> DNA

<213> Rattus norvegicus

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<211> 24

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<213> Rattus norvegicus

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<223> n is i

<400> 9
nywngcnccn atraanarnc c

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<210> 10
<211> 8
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<213> Rattus norvegicus

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<222> (3)
<223> Xaa is Gly or Ala

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<223> Xaa is Ile or Leu

<400> 10
Arg Tyr Xaa Lys Glu Xaa Ser Met
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<210> 11
<211> 8
<212> PRT
<213> Rattus norvegicus

<220>
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<223> Xaa is Ile or Leu

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<400> 11

Gly Leu Phe Ile Gly Ala Ser Xaa
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<210> 12

<211> 533

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<220>

<223> Description of Unknown Organism: Sequence source
uncertain

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20 25 30

Ile Phe Gly Pro Gly Gly Leu Thr Leu Arg Arg Gly Leu Trp Ala Thr
35 40 45

Ala Val Leu Leu Ser Leu Ala Ala Phe Leu Tyr Gln Val Ala Glu Arg
50 55 60

Val Arg Tyr Tyr Gly Glu Phe His His Lys Thr Thr Leu Asp Glu Arg
65 70 75 80

Glu Ser His Gln Leu Thr Phe Pro Ala Val Thr Leu Cys Asn Ile Asn
85 90 95

Pro Leu Arg Arg Ser Arg Leu Thr Pro Asn Asp Leu His Trp Ala Gly
100 105 110

Thr Ala Leu Leu Gly Leu Asp Pro Ala Glu His Ala Ala Tyr Leu Arg
115 120 125

Ala Leu Gly Gln Pro Pro Ala Pro Pro Gly Phe Met Pro Ser Pro Thr
130 135 140

Phe Asp Met Ala Gln Leu Tyr Ala Arg Ala Gly His Ser Leu Glu Asp
145 150 155 160

Met Leu Leu Asp Cys Arg Tyr Arg Gly Gln Pro Cys Gly Pro Glu Asn
165 170 175

Phe Thr Val Ile Phe Thr Arg Met Gly Gln Cys Tyr Thr Phe Asn Ser
180 185 190

Gly Ala His Gly Ala Glu Leu Leu Thr Thr Pro Lys Gly Gly Ala Gly
195 200 205

Asn Gly Leu Glu Ile Met Leu Asp Val Gln Gln Glu Glu Tyr Leu Pro
210 215 220

cl
cont

Ile Trp Lys Asp Met Glu Glu Thr Pro Phe Glu Val Gly Ile Arg Val
225 230 235 240

Gln Ile His Ser Gln Asp Glu Pro Pro Ala Ile Asp Gln Leu Gly Phe
245 250 255

Gly Ala Ala Pro Gly His Gln Thr Phe Val Ser Cys Gln Gln Gln Gln
260 265 270

Leu Ser Phe Leu Pro Pro Pro Trp Gly Asp Cys Asn Thr Ala Ser Leu
275 280 285

Asp Pro Asp Asp Phe Asp Pro Glu Pro Ser Asp Pro Leu Gly Ser Pro
290 295 300

Arg Pro Arg Pro Ser Pro Pro Tyr Ser Leu Ile Gly Cys Arg Leu Ala
305 310 315 320

Cys Glu Ser Arg Tyr Val Ala Arg Lys Cys Gly Cys Arg Met Met His
325 330 335

Met Pro Gly Asn Ser Pro Val Cys Ser Pro Gln Gln Tyr Lys Asp Cys
340 345 350

Ala Ser Pro Ala Leu Asp Ala Met Leu Arg Lys Asp Thr Cys Val Cys
355 360 365

Pro Asn Pro Cys Ala Thr Thr Arg Tyr Ala Lys Glu Leu Ser Met Val
370 375 380

Arg Ile Pro Ser Arg Ala Ser Ala Arg Tyr Leu Ala Arg Lys Tyr Asn
385 390 395 400

Arg Ser Glu Ser Tyr Ile Thr Glu Asn Val Leu Val Leu Asp Ile Phe
405 410 415

Phe Glu Ala Leu Asn Tyr Glu Ala Val Glu Gln Lys Ala Ala Tyr Glu
420 425 430

Val Ser Glu Leu Leu Gly Asp Ile Gly Gly Gln Met Gly Leu Phe Ile
435 440 445

Gly Ala Ser Leu Leu Thr Ile Leu Glu Ile Leu Asp Tyr Leu Cys Glu
450 455 460

Val Phe Gln Asp Arg Val Leu Gly Tyr Phe Trp Asn Arg Arg Ser Ala
465 470 475 480

Gln Lys Arg Ser Gly Asn Thr Leu Leu Gln Glu Glu Leu Asn Gly His
485 490 495

Arg Thr His Val Pro His Leu Ser Leu Gly Pro Arg Pro Pro Thr Thr
500 505 510

Pro Cys Ala Val Thr Lys Thr Leu Ser Ala Ser His Arg Thr Cys Tyr
515 520 525

cb
Cmt

Leu Val Thr Arg Leu
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<210> 13
<211> 512
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Sequence source
uncertain

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20 25 30
Phe Val Glu Gly Gly Pro Gly Pro Arg Gln Ala Leu Trp Ala Val Ala
35 40 45
Phe Val Ile Ala Leu Gly Ala Phe Leu Cys Gln Val Gly Asp Arg Val
50 55 60
Ala Tyr Tyr Leu Ser Tyr Pro His Val Thr Leu Leu Asp Glu Val Ala
65 70 75 80
Thr Ser Glu Leu Val Phe Pro Ala Val Thr Phe Cys Asn Thr Asn Ala
85 90 95
Val Arg Leu Ser Gln Leu Ser Tyr Pro Asp Leu Leu Tyr Leu Ala Pro
100 105 110
Met Leu Gly Leu Asp Glu Ser Asp Pro Gly Val Pro Leu Ala Pro Pro
115 120 125
Gly Pro Glu Ala Phe Ser Gly Glu Pro Phe Asn Leu His Arg Phe Tyr
130 135 140
Asn Arg Ser Cys His Arg Leu Glu Asp Met Leu Leu Tyr Cys Ser Tyr
145 150 155 160
Cys Gly Gly Pro Cys Gly Pro His Asn Phe Ser Val Val Phe Thr Arg
165 170 175
Tyr Gly Lys Cys Tyr Thr Phe Asn Ser Gly Gln Asp Gly Arg Pro Arg
180 185 190
Leu Lys Thr Met Lys Gly Gly Thr Gly Asn Gly Leu Glu Ile Met Leu
195 200 205
Asp Ile Gln Gln Asp Glu Tyr Leu Pro Val Trp Gly Glu Thr Asp Glu
210 215 220

C6
Cont

Thr Ser Phe Glu Ala Gly Ile Lys Val Gln Ile His Ser Gln Asp Glu
225 230 235 240

Pro Pro Phe Ile Asp Gln Leu Gly Phe Gly Val Ala Pro Gly Phe Gln
245 250 255

Thr Phe Val Ser Cys Gln Glu Gln Arg Leu Ile Tyr Leu Pro Ser Pro
260 265 270

Trp Gly Thr Cys Asn Ala Val Thr Met Asp Ser Asp Phe Phe Asp Ser
275 280 285

Tyr Ser Ile Thr Ala Cys Arg Ile Asp Cys Glu Thr Arg Tyr Leu Val
290 295 300

Glu Asn Cys Asn Cys Arg Met Val His Met Pro Gly Asp Ala Pro Tyr
305 310 315 320

Cys Thr Pro Glu Gln Tyr Lys Glu Cys Ala Asp Pro Ala Leu Asp Phe
325 330 335

Leu Val Glu Lys Asp Gln Glu Tyr Cys Val Cys Glu Met Pro Cys Asn
340 345 350

Leu Thr Arg Tyr Gly Lys Glu Leu Ser Met Val Lys Ile Pro Ser Lys
355 360 365

Ala Ser Ala Lys Tyr Leu Ala Lys Lys Phe Asn Lys Ser Glu Gln Tyr
370 375 380

Ile Gly Glu Asn Ile Leu Val Leu Asp Ile Phe Phe Glu Val Leu Asn
385 390 395 400

Tyr Glu Thr Ile Glu Gln Lys Lys Ala Tyr Glu Ile Ala Gly Leu Leu
405 410 415

Gly Asp Ile Gly Gly Gln Met Gly Leu Phe Ile Gly Ala Ser Ile Leu
420 425 430

Thr Val Leu Glu Leu Phe Asp Tyr Ala Tyr Glu Val Ile Lys His Arg
435 440 445

Leu Cys Arg Arg Gly Lys Cys Gln Lys Glu Ala Lys Arg Ser Ser Ala
450 455 460

Asp Lys Gly Val Ala Leu Ser Leu Asp Asp Val Lys Arg His Asn Pro
465 470 475 480

Cys Glu Ser Leu Arg Gly His Pro Ala Gly Met Thr Tyr Ala Ala Asn
485 490 495

Ile Leu Pro His His Pro Ala Arg Gly Thr Phe Glu Asp Phe Thr Cys
500 505 510

Cb